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UNITED STATES GOVERNMENT

Memorandum

Tolson _____
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Conrad _____
DeLoach _____
Evans _____
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Sullivan _____
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Gandy _____

TO: MR. W. C. SULLIVAN *WCS* - 3/4/64

FROM: MR. D. J. BRENNAN, JR. *DBJ*

SUBJECT: PROTECTION OF THE PRESIDENT

DATE: February 13, 1964

My memorandum January 17, 1964, reported that the Department of Defense, in conjunction with industry and the Secret Service, was attempting to develop technical methods of protecting the President.

Defense Department has now furnished the attached Progress Report on "Project Star," which is the code name for this research effort. This report reflects that research is under way to modify an existing Presidential limousine so that its armor will stop 30-caliber ball ammunition. Defense hopes to be able to produce a design for a car by September 1, 1964, which will be so well armored that it will stop 30-caliber armor-piercing ammunition.

Additional research is being carried on to develop a bullet-proof, grenade-proof, and explosive-proof speaker platform for Presidential use. In connection with this, research is being done on means of distracting or disrupting an attack on the President and on acoustic and electronic devices which will detect the approach of any projectile toward the President.

The helicopters used by the President are to be armored, and research is being conducted to make them safer.

ACTION:

For information. We will continue to follow this matter with Defense and Secret Service.

Enclosure

BAW:hke *hke*
(8) **ENCLOSURE**

- 1-Mr. Belmont
- 1-Mr. Conrad
- 1-Mr. Sullivan
- 1-Mr. Malley
- 1-Mr. Bartlett
- 1-Liaison
- 1-Mr. Wells

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PROJECT STAR

SECURITY THREAT ANALYSIS AND RESEARCH

Progress Report

12 December 1963 - 20 January 1964

In early December 1963, elements of the Department of Defense initiated a research and development program in support of efforts to reduce the vulnerability of important political persons to assassination. This action was the result of arrangements made by the U.S. Secret Service (USSS), the Director of the Office of Science and Technology (OST), the Director of Defense Research and Engineering (ODDR&E), and the Director of the Advanced Research Projects Agency (ARPA).

The principal tasks are: (1) the modification of an existing limousine to defeat .30 calibre ball ammunition, and delivery of the modified vehicle in early March 1964; (2) the design of second-generation limousines to defeat .30 calibre armor-piercing ammunition, with vehicle delivery no later than 1 September 1964; (3) an initial analysis of the characteristics of likely modes of attack and a survey of possible and practicable countermeasures, to be completed by 15 January 1964; (4) detailed analysis of likely modes of attack and development and evaluation of appropriate countermeasures, with a phase report by 1 May 1964, and completion by 30 June 1965. The first task is referred to as the "quick-fix automobile," while the remaining tasks are identified as Project STAR.

Quick-Fix Automobile:

Under the direction of representatives of Dr. E. G. Fubini, ODDR&E, a group of people was assembled from ballistics and materials organizations in ODDR&E, ARPA, Army, Navy and Air Force, to design and specify modifications for the "quick-fix automobile." A mock-up of the modified auto was prepared by Hess and Eisenhardt of Cincinnati and was approved by the USSS and ODDR&E representatives on 30 December 1963.

Armor materials are being tested by the U. S. Army Development and Proof Services (DPS) at Aberdeen Proving Ground in accordance with a test plan developed by the U. S. Army Tank and Automotive Center (ATAC) and the U. S. Army Materials Research Agency (AMRA). This

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work has been funded by the U. S. Army and ARPA. Transparent armor materials are being provided by PittsburghPlate Glass.

The Ford Motor Company and Hess and Eisenhardt are incorporating the approved modifications in the existing limousine. At this time (20 January 1964) work on the quick-fix auto is on schedule. A more difficult phase of this task - namely, the molding of curved transparent armor sections - has been reached and some difficulties are expected although no serious delays are anticipated. Detailed specifications for the quick-fix auto are in the hands of the USSS.

Project STAR:

Project STAR - the remaining three tasks listed earlier - is under the direction of representatives of Dr. R. L. Sproull, Director of ARPA. Members of ODDR&E, USATAC, USAMRA, USADPS, USARO, the Bureau of Naval Weapons, U.S. Air Force, USSS, CIA, State Department Security Office, and the FBI have participated with ARPA in STAR. However, responsibility for any shortcomings in the work thus far rests solely with the undersigned.

Security classification instructions under which Project STAR is operating at the request of the Secret Service are contained in Enclosure 1.

Preliminary design specifications for the second-generation auto have been developed by the Research Analysis Corporation (RAC) and were given to the USSS on 15 January 1964. Preliminary analyses of security threat characteristics and possible countermeasures have been completed by RAC, Rand and IDA, and were sent to the USSS on 20 January 1964. Details are contained in reports designated RAC-622.1, Rand L-820, and IDA Hq 64-2254. (Copies are attached as Enclosures 3, 4&5). These deal, respectively, with scheduled transportation situations, scheduled public appearances, and nonscheduled public appearances.

These reports contain preliminary assessments of threat characteristics and tentative suggestions for countermeasures. They identify some countermeasures which could be implemented immediately. But they principally serve to identify areas which warrant detailed study and investigation. Among these are some which should be completed insofar as possible by about 1 May 1964 in an effort to establish detailed quantitative specifications for materials, techniques, and devices to be incorporated in vehicles and speakers' stands prior to

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1 September 1964. These protective measures are to be the best that can be developed and evaluated in this time-frame, but it is recognized that optimum measures will require more lengthy investigations and experimentation.

The plan of work under Project STAR subsequent to 20 January 1964 includes the following tasks:

a. Second and Subsequent Generation Automobiles: In coordination with manufacturers to be designated by the USSS and USATAC, complete the detailed design of protective measures for two automobiles to be delivered to the USSS by 1 September 1964 and provide technical advice on their fabrication. One auto is to be closed, but with maximum visibility of the passengers; the other is to be open above the body line, but also have optional means of enclosing the passenger compartment. Within these limits, the dictates of conventional styling, and the time available, protective measures listed in Enclosure 2 should be incorporated to the extent feasible. (Initial report on 1 March 1964 on the second generation automobiles to be as complete as possible at that time; modify and update the initial report as the results of the other tasks under Project STAR become available. RAC.)

b. Speakers' Platforms: Design and evaluate means for defeating .30 calibre AP projectiles, grenades, and explosives at indoor and outdoor speakers' platforms. These means should be inconspicuous and transportable, and should permit rapid placement. No component or section should weigh more than 100 pounds. Nonlethal means for distracting or disrupting an incipient attack, and acoustic sensing devices to detect the approach, impact, or passage of a projectile should be included with platform protection kits. Results of the other Project STAR tasks listed herein should be applied to these requirements as those results become available. (An initial design and report of its evaluation should be submitted by 1 May 1964. Continuing work should be carried out beyond that date to incorporate significant improvements in the initial design specifications as progress on other tasks permits.)

c. Helicopters:

(1) Analyze the design of the helicopters utilized by the President to identify critical areas for attack by .30 calibre AP ammunition, and to assess personnel survivability in a crash. Prepare specifications for means such as light weight armor to reduce the vulnerability of critical areas. Prepare specifications

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for modifications needed to enhance the possibility of survival of persons aboard in a crash. Include an acoustic sensor to detect the impact or passage of a projectile. (Report by 1 May 1964 to be as complete as possible at that time; continue studies and experiments to seek significant improvements through 30 June 1965. USATRECOM.)

(2) Evaluate the expected performance of the protective measures and of the aircraft, and perform a comparative analysis of the vulnerability, survivability, and aircraft performance with and without the proposed protective measures. (Complete these tasks on the 1 May 1964 specifications prior to 1 July 1964, and on additional improved specifications proposed by USATRECOM as soon as possible. RAC)

d. Weapons: Identify likely classes of weapons employable by an individual and their performance characteristics in terms of kill probability against an unprotected human target as a function of range, angle of attack, CEP, and relative speed of the target. Also, identify the penetrating force of likely projectiles as a function of their velocity, weight, shape, angle of incidence, and structure, and specify in useful terms the forces to be defeated. (Progress report by 1 May 1964; to be completed as soon thereafter as possible. RAC, in coordination with the USA Ballistics Research Lab.)

e. Situations: Develop and evaluate a methodology for quickly identifying and assessing the relative significance, in terms of kill probability, of vantage points available for the launching of an attack in typical travel and public appearance situations. (Report on 1 May 1964 to be as complete as possible at that time; task to be completed as soon thereafter as possible. RAC in coordination with the USSS.)

f. Persons and Data Processing: Identify and evaluate criteria and technical means for extremely rapid processing of data on large numbers of suspected persons in order to identify those for whom some specified degree of surveillance is warranted, and to facilitate establishment and maintenance of the required degree of surveillance by the appropriate authorities. (Report on 1 May 1964 to be as complete as possible at that time; task to be completed as soon thereafter as possible. Rand in coordination with the USSS.)

g. Procedures:

(1) Evaluate procedures for marshalling the security capabilities of the U.S. in support of the USSS and the Department of State

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Security Division in carrying out their personal security responsibilities. Make recommendations for improvements. (To be completed by 1 May 1964. Rand in coordination with the USSS.)

(2) From historical data, develop methods and techniques for evaluating the effectiveness of security operations for use by USSS and the Department of State Security Division in the training of their security agents. (Rand in coordination with the USSS, Department of State Security Division, and others who may be designated by ARPA.)

h. Detection Devices:

(1) Develop and evaluate acoustical sensor systems to detect the approach, impact, or passage of projectiles traveling at 700 to 5000 fps in the vicinity of the target. Separate systems should be designed to be carried inconspicuously by an agent, to be installed on an automobile, and to be installed on rotary and fixed-wing subsonic aircraft. Priority should be placed on detection of supersonic projectiles. In the case of subsonic projectiles, detection of the muzzle blast is acceptable. In both cases evaluation and design should eliminate false alarms to the extent practicable. (Aircraft units to be the responsibility of the U.S. Army Limited War Lab, using Thiokol or Bissett-Berman as the contractor, as an extension of an existing joint Army-ARPA project; the man-carried and automobile units to be the responsibility of the U.S. Army ERDL, using Melpar as a contractor. Work on all of these units should be completed prior to 1 July 1964.)

(2) Develop and evaluate systems to detect the presence of concealed firearms and grenades. Both man-portable and fixed systems, to be utilized inconspicuously at locations which give access to the target are desired. It is essential that the false alarm rate be extremely low. Furnish quantitative data on results. Prepare specifications for any needed additional research and development. (To be completed as soon as possible through parallel efforts by Rand and by the Southwest Research Institute or Melpar under USAERDL contract.)

(3) Evaluate systems or techniques for detecting intrusion of a fixed security area, such as the White House grounds. Furnish quantitative data on results. Prepare specifications for any needed additional research and development. (To be completed as soon as

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possible. IDA, in coordination with the USSS and the USAERDL.)

i. Armor Materials: Conduct an accelerated program to test the effectiveness of transparent and opaque materials now available in defeating .30 cal. AP projectiles, grenades, and explosives. Various combinations and configurations of materials should be tested at various appropriate degrees of impact obliquity, and results reported. Rigid and flexible materials in shapes and forms suitable for use on automobiles, helicopters, speakers' platforms, and on persons should receive priority. Furnish quantitative data on results. Prepare specifications for any needed additional research and development. (Tests to be carried out by Development and Proof Services, Aberdeen Proving Ground in accordance with test plans to be developed by RAC, in coordination with U.S.A. Ballistics Research Lab, U.S.A. Materials Research Agency, Bureau of Weapons, AFMT-RTD, and Bureau of Standards. Initial report of results of testing of materials for models of speakers' platforms and second generation automobiles by 1 May 1964. Comparative evaluation of results and development of specifications for needed additional research and development by RAC.)

j. Distraction Devices: Develop and evaluate means for distracting or disrupting an incipient attack by nonlethal means, such as light, smoke, and means for rendering normally transparent areas opaque. Both manually-operated and automatic means are to be considered. Man-portable means which are normally inconspicuous, and means attached to autos or speakers' platforms are desired. Furnish quantitative data on results. Prepare specifications for any needed additional research and development. (Report by 1 May 1964 to be as complete as possible at that time; completion as soon thereafter as possible. Design of the means, development and technical guidance of the implementation of a test program, and evaluation of results, to be accomplished by IDA, in coordination with Bureau of Weapons and AFMT-RTD. Hardware development and implementation of the test program by USAERDL, with assistance of appropriate contractors.)

It will be noted from the foregoing that the remainder of the program subsequent to 20 January 1964 consists of two categories of tasks. First, for the transportation and public appearance situations, evaluate such practicable materials, techniques and devices as can be delivered to the USSS by 1 September 1964, and prepare specifications for any needed additional research and development. Second, carry out longer-term analyses, experiments and developmental work to be completed as soon as possible. It is expected that useful results will be furnished the USSS as rapidly as they can be obtained rather than awaiting some fixed date for report submission.

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A monthly progress report, due by the first of each month, with the first report to be submitted by 1 March 1964, should be submitted to ARPA by each agency or contractor having tasks assigned to it. ARPA will submit a monthly consolidated progress report by the tenth of each month to DDR&E, OST, and USSS.

Detailed proposals and firm cost estimates for the above tasks will be sought, with submissions to ARPA by 15 February 1964, or as soon thereafter as possible. Implementation of each task will be proposed to the Director of ARPA by the Project Manager of STAR in accordance with established ARPA procedures.

Harry E. Tabor
Colonel, USA

Enclosures:

Security Classifications
Second Generation Auto
RAC Report, 622.1
Rand, L-820 dtd 1/13/64
IDA Hq 64-2254

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PROJECT STAR

Security Classifications

At the request of the U. S. Secret Service the following security guidance has been adopted for Project STAR:

The acronym Project STAR is, itself, unclassified, unless the name is associated with other material which is of a classified nature in accordance with following guidance. In this latter case, the higher classification involved will apply.

Written materials should be Confidential or Secret, according to their content. Any written material containing substantive analyses, data, or recommendations should normally be Secret. Other written materials should be Confidential. Nothing in writing which identifies the subject matter of the writing with the substance of Project STAR should be classified below Confidential.

Physical items - mock-ups, etc. - other than in written form, which are not identifiable as being related uniquely to STAR, are to be classified according to their own nature. However, if they are identifiable by an observer with Project STAR and its purposes, they will normally be Secret.

It is emphasized that all materials which could identify the purposes of Project STAR, and tactics, techniques and devices as well as performance data on materials which might be adopted as a consequence of the Project are to be classified no lower than Secret and protected on a strict need-to-know basis. Furthermore, STAR materials are not releasable to any agency other than ARPA without the explicit prior approval of ARPA.

In addition to the foregoing guidance, it is strongly emphasized that in contacts with people or organizations other than within the Department of Defense and the U. S. Secret Service, there must be no attributable identification of Project STAR with the question of Presidential security. Project STAR is, as you know, the short title for Security Threat Analysis and Research. As such, it is concerned with threats to political figures in general and any mention of its relation to Presidential security in contacts with people other than from ARPA and the United States Secret Service is both needless and prohibited.

STAR materials transmitted to ARPA will be coordinated with the U. S. Secret Service by ARPA and concurrence of the Secret Service will be obtained by ARPA before such materials are released to any other agency.

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Encl 1 to Progress Report

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PROJECT STAR

DESIGN CONSIDERATIONS

Second Generation Vehicles

Two vehicles, one open and one closed, are to be designed.

a. Protective Measures Desired:

(1) Protection to defeat .30 cal. AP rounds at most likely angles of attack.

(2) Protection to defeat thrown fragmentation grenades, explosive charges, and Molotov cocktails.

(3) Techniques and devices for disrupting or degrading, by nonlethal means, an incipient attack.

(4) Techniques and devices for detecting the approach, impact, or passage of projectiles traveling at 700 to 5000 fps, and providing optional visual and audible alarm.

b. These autos also should possess the following characteristics:

(1) The two autos together should be transportable in a C-130 aircraft at a range of 2000 nm, and should be capable of being loaded aboard this aircraft over the ramp under their own power.

(2) Accommodate four people in the passenger compartment with equal protection for all.

(3) In the case of the closed model, provide for ready opening of a roof section to permit two people to stand erect. (A sliding section is preferred.)

(4) In the case of the open model, provide optional transparent armor protection above the body line.

(5) Turning radius and maneuverability should be improved in comparison with the present Presidential limousine.

(6) The fuel tank should provide a range of at least 200 miles and should be self-sealing and be protected against blast effects. Also, if feasible, it should be moved away from the passenger compartment.

Encl 2 to Progress Report

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(7) Dual fuel and ignition systems, for emergency reserve purposes, should be provided to the extent feasible.

(8) Be able to operate at speeds of 10-20 mph for about ten miles without engine overheating, and also be able to accelerate at rates comparable to standard medium passenger autos.

(9) Be equipped with automatic and manually controllable fire extinguishers to extinguish engine or fuel fires.

(10) Be equipped with CO detectors, controlled dual air intakes to permit use of alternate intakes if wind conditions cause internal CO contamination, protection against access to air intake openings by unauthorized persons and against entry of foreign objects.

(11) Be equipped with tires designed to permit high speed operation for at least one mile after being punctured by gunfire or grenade fragments.

(12) Be designed to eliminate insofar as possible the hazard of secondary missiles, such as bolts and accessory equipment which might be accelerated to lethal velocities by sudden impacts.

(13) External surfaces should be free of ignitable materials to reduce the hazard of Molotov cocktails.

(14) Be equipped with locks controllable from the inside of the automobile to prevent unauthorized entry while the vehicle is in use. Provide keys to permit the internal locking system to be overridden from outside the vehicle.

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